

Patient Navigation for Underserved Patients Diagnosed with Breast Cancer

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LEARNING OBJECTIVES

After completing this course, the reader will be able to:

1. Describe the role and potential benefits of patient navigation in breast cancer care.
2. Explain disparities in breast cancer care and their impact on patient populations.

CME

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ABSTRACT

The elimination of cancer disparities is critically important for lessening the burden of breast cancer (BC). Patient navigator programs (PNPs) have been shown to improve rates of BC screening in underserved communities, but there is a dearth of evidence regarding their benefits after the actual diagnosis of BC. We retrospectively examined sociodemographic characteristics, disease characteristics, and concordance to quality measures (QMs) of BC care among women participating in a PNP that services disadvantaged minority communities in the greater Boston area. Of the 186 PNP patients diagnosed with BC in 2001–2011 in three neighborhood community health centers, treatment data was available for 158 (85%) and race and disease stage information was available for 149 (80%). Regarding stage,

25% were diagnosed with in situ cancer, 32% had stage 1, 25% had stage 2, 13% had stage 3, and 5% had stage 4 BC. Guideline-indicated care was received by 70 of 74 patients (95%) for the hormonal therapy QM, 15 of 17 (88%) patients for the chemotherapy QM, and 65 of 71 (92%) patients for the radiation QM, all similar to published concordance rates at elite National Comprehensive Cancer Network institutions. These findings suggest that PNPs may facilitate evidence-based quality care for vulnerable populations. Future research should prospectively analyze quality metrics to assess measures to improve the process and outcomes of patient navigation in diverse underserved settings, compared with control non-navigated populations. *The Oncologist* 2012;17:1027–1031

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BACKGROUND

Despite major advances in cancer research, screening, and treatment, not all Americans with cancer have benefited equally. Although there was a 14% decrease in cancer-related deaths over the years 1991–2004, racial and ethnic minority patients continue to die disproportionately from cancer, compared with their white counterparts, even after adjusting for insurance status and income [1]. There is increasing evidence that the disconnect between discoveries in cancer care and their timely delivery to all Americans contributes to cancer disparities. Solutions to improve the equity of cancer care delivery are desperately needed [2].

Patient navigation programs (PNPs) have emerged as a potential solution for improving cancer care delivery [3, 4]. PNPs facilitate access to quality medical care by identifying barriers to care and by bridging gaps in care through culturally sensitive coordination. Patient navigators are resources for patients and providers and may assist with all phases of access, including primary cancer prevention, screening and follow-up care, cancer treatment, and survivorship care [5].

Extensive data have established the efficacy of navigation in improving the timeliness and receipt of cancer screening and diagnostic care after an abnormal screening test [6–11]. However, it is unknown whether or not PNPs improve patient care and outcomes following the actual diagnosis of cancer. We sought to evaluate the clinical outcomes of patients enrolled in the Massachusetts General Hospital (MGH) Avon Breast Care Program (MABCP) based on evidence-based national quality measures. The MABCP provides patient navigation services to racially and ethnically diverse communities seeking care at four federally qualified health centers in the greater Boston area, and thus represent a population vulnerable for poor cancer outcomes.

METHODS

We performed a retrospective chart review of all 186 women diagnosed with breast cancer who participated in the MABCP in 2001–2011. Since its inception in 2001, the MABCP has served four community health centers and has provided primary screening services and diagnostic follow-up of abnormal screening examinations for ~4,000 patients. Of these 4,000 patients, 186 patients (4.7%) were diagnosed with breast cancer.

Patients in need of routine screening mammography are referred to the MABCP by their community health center primary care physician. The patient navigators automatically enroll all patients at these centers who have abnormal screening examinations and require diagnostic follow-up examinations. MABCP navigators follow the community health worker model [5] and are trained lay workers who are culturally diverse and generally representative of the population served by their community health center. Languages spoken by the navigators include Spanish, Bosnian, and Portuguese.

Most patients received their subsequent cancer care at either MGH or Boston Medical Center. Institutional review board approval was obtained at both sites. Sociodemographic data and treatment data were obtained by review of patient charts within the respective electronic medical records.

Table 1. Sociodemographic characteristics of Massachusetts General Hospital Avon Breast Care Program breast cancer patients (*n* = 186)

Characteristic	<i>n</i>	%
Race or ethnicity		
White	59	32
Black	30	16
Hispanic	52	28
Asian/Middle Eastern	8	4
Not disclosed	37	20
Language		
English	106	57
Spanish	55	30
Creole	10	5
Vietnamese	10	5
Bosnian	3	2
Portuguese	2	1
Median age (range), yrs	58 (19–93)	
Insurance status		
Uninsured	12	6
Free Care	5	3
Medicaid	23	12
Medicare	45	24
Private	58	31
Unknown	43	23
Highest education level		
None	2	1
≤Grade 8	25	13
Some high school	12	6
High school or general educational development	48	26
Some college	9	5
College graduate	12	6
Unknown	82	44

Descriptive statistics were used to analyze baseline sociodemographic characteristics. Clinical outcomes were analyzed using data abstracted from electronic medical records. Two physicians collected data using a chart abstraction form and entered the data into a secure Microsoft® Excel database. Abstracted clinical data were used to examine concordance with American Society of Clinical Oncology/National Comprehensive Cancer Network (ASCO/NCCN) quality measures.

Quality Measures

Three ASCO/NCCN quality measures based on NCCN level 1 evidence were analyzed to determine quality of cancer care. These included: (a) hormonal therapy within 1 year of diagnosis of hormone receptor (HR)⁺ tumors >1 cm, (b) chemother-

Table 2. Race or ethnicity and disease stage of Massachusetts General Hospital Avon Breast Care Program breast cancer patients (*n* = 149)

Race or ethnicity	Stage 0	Stage 1	Stage 2	Stage 3	Stage 4	Race, <i>n</i> (%)
White	16	18	17	5	3	59 (40%)
Black	5	7	8	9	1	30 (20%)
Hispanic	16	19	11	3	3	52 (35%)
Asian or Middle Eastern	0	4	2	2	0	8 (5%)
Total (%)	37 (25%)	48 (32%)	38 (25%)	19 (13%)	7 (5%)	149

Table 3. Concordance rates with American Society of Clinical Oncology/NCCN guidelines (MABCP versus NCCN centers)

Quality measure	MABCP	NCCN Centers	<i>p</i> -value
Hormonal therapy	95% (70/74)	89% (2751/3091)	.72
Chemotherapy	88% (15/17)	87% (1044/1200)	.97
Radiation therapy	92% (65/71)	95% (2679/2829)	.85

Abbreviations: MABCP, Massachusetts General Hospital Avon Breast Care Program; NCCN, National Comprehensive Cancer Network.

apy within 120 days of diagnosis of HR[−] tumors >1 cm for women aged <70 years, and (c) postlumpectomy radiation therapy.

Descriptive statistics were used to report patient characteristics and determine the proportion of navigated patients who had documented care that was in concordance with these three quality metrics. Concordance data for these quality measures across all NCCN institutions were used as a benchmark for MABCP patients [12]. Concordance rates between MABCP patients and NCCN institution patients were compared using χ^2 analyses.

RESULTS

Self-reported sociodemographic data, including language spoken, age, insurance status, and level of education of MABCP patients diagnosed with breast cancer was available for the 186 patients in the MABCP. Missing data were attributed to patients declining to report these characteristics. In terms of race and ethnicity, 60% of the patients in the program were non-white black, Hispanic, and Asian or Middle Eastern. Forty-three percent of MABCP patients were non-English speaking. Twenty-one percent were either uninsured or were enrolled in Medicaid or Free Care. Thirty-seven percent had high school or general educational development education or greater (Table 1).

Of the 186 MABCP patients diagnosed with breast cancer, treatment data were available for 158 (85%) and race and breast cancer stage information was available for 149 (80%) (Table 2). In terms of stage of disease at diagnosis, 25% were diagnosed with in situ cancer, 32% had stage 1, 25% had stage 2, 13% had stage 3, and 5% had stage 4 breast cancer. Although

there were no obvious differences between racial or ethnic groups with regard to breast cancer stage, the numbers are too small to make direct statistical comparisons. In our limited dataset, black patients appeared to be diagnosed with stage 3 disease more frequently than white patients. In terms of disease characteristics (data not shown), 91% of the navigated patients had HR⁺ disease and 10% of the patients had human epidermal growth factor receptor 2–positive disease.

QMs

Table 3 illustrates concordance with ASCO/NCCN quality measure among MABCP patients compared with concordance rates for patients who received breast cancer care at NCCN institutions. For the hormonal therapy quality measure, 95% of the MABCP patients received hormonal therapy within 1 year of diagnosis for HR⁺ tumors >1 cm. For the chemotherapy quality measure, 88% of the patients in the MABCP received chemotherapy within 120 days of diagnosis of HR[−] breast cancer >1 cm. For the radiation quality measure, 92% of the patients received postlumpectomy radiation therapy. These concordance rates are comparable with rates from eight NCCN centers, largely viewed as elite cancer centers in the U.S. [12]. There was no significant difference (*p* > .05) between MABCP patients and NCCN patients with regard to each of the quality measures. Upon detailed review of the treatment records of MABCP patients, patients received standard adjuvant chemotherapy regimens such as doxorubicin, cyclophosphamide followed by paclitaxel, and docetaxel plus cyclophosphamide. With regard to endocrine therapy, the proper medication was prescribed to patients. For example, tamoxifen was prescribed for premenopausal patients and aromatase inhibitors were prescribed for postmenopausal patients.

DISCUSSION

In this study, we demonstrated that breast cancer patients who received navigation services received high-quality cancer care, as defined by concordance with ASCO/NCCN quality measures. These navigated patients also had a favorable breast cancer stage distribution, with >50% having in situ or stage 1 disease, similar to that of white women reported by the Surveillance, Epidemiology, and End Results program [13]. This staging profile is also comparable with that of the white breast cancer population in Massachusetts as reported by the Massachusetts Cancer Registry [14, 15]. Our findings are particularly

notable given the sociodemographic characteristics of these patients, a significant proportion of whom are non-English speaking, are underinsured, and have a low level of education. Our findings add to the growing body of literature that suggests that navigation is a viable approach to reduce breast cancer health disparities by improving early detection rates and perhaps ensuring receipt of quality cancer treatment.

Much of the patient navigation literature addressing the care of cancer patients focuses on improving screening rates and the diagnostic management of abnormal screening results [9, 16, 17]. Most studies have shown better outcomes when patients receive patient navigation services. However, evidence that PNPs improve clinical outcomes after a cancer diagnosis is lacking. Arguably, patient navigation is equally, if not more, important after a cancer diagnosis given the logistical complexities and financial burdens of cancer treatment such as chemotherapy or radiation. In our patient population, 15% of the patients opted for treatment at other institutions, and therefore their treatment data were unavailable. However, among those patients with available data, at least 87% received care that adhered to guidelines. Some reports suggest that patient navigation after a cancer diagnosis improves patient satisfaction and reduces barriers to care [18, 19]. Guadagnolo and colleagues showed that patient navigation led to fewer cancer treatment interruptions and higher rates of clinical trial enrollment among Native American cancer patients, compared with historical controls [20]. Ell and colleagues showed that cancer treatment adherence was better than in historical controls among patients who received navigation services [21]. Our study offers additional data to support the efficacy of PNPs for patients diagnosed with cancer.

Our finding of a high concordance with level 1 ASCO/NCCN quality measures has important implications for the underserved and vulnerable patients diagnosed with breast cancer. These level 1 quality measures are based on randomized controlled clinical trials. Our data suggest that patient navigation may offer an effective strategy to overcome barriers that interfere with access to quality cancer care for underserved communities.

Major weaknesses of our study are that it was a retrospective analysis and data regarding the outcomes of 15% of the patients are missing. Fifteen percent of MABCP patients elected to receive their cancer care at institutions other than MGH or Boston Medical Center, and therefore we lack treatment data for these patients. However, their sociodemographic data otherwise closely matched those of the patients for whom we do have treatment data, suggesting that their treatment experience may match that of the larger population. Another

weakness of our study is the extent of missing data, particularly with respect to education and insurance status. Our cohort may be disproportionately influenced by more highly educated and insured patients, leading to selection bias. Another weakness of this study is the lack of a closely matched control group that did not receive patient navigation. Similar studies in the literature often use historical controls as a reference group, but this strategy also has weaknesses, including the inability to account for improved outcomes with modern cancer therapies. We used data from patients receiving treatment at NCCN centers during the same time period as the benchmark to demonstrate that our navigated patients received similar quality care. Finally, another weakness of the study is the relatively small number of women diagnosed with breast cancer ($n = 186$) within the MABCP, making it difficult to draw definitive conclusions about this population.

Despite these weaknesses, our findings provide objective evidence that vulnerable populations may indeed receive quality cancer care when enrolled in a PNP, further prioritizing the need for rigorous research, ideally large, multicenter, prospective, randomized, controlled trials of patient navigation in patients diagnosed with cancer. Such trials are currently under way at the nine sites participating in the National Cancer Institute (NCI) Patient Navigation Research Program [22]. However, these trials are primarily enrolling patients for cancer screening, not after a cancer diagnosis. Additionally, the issue of randomizing patients to an intervention that is intuitively beneficial versus control (no intervention) raises ethical considerations. However, this national effort will provide insight into the role of patient navigation after a breast cancer diagnosis and, importantly, will allow evaluation of the cost-effectiveness of this approach [23, 24].

In conclusion, we have shown that patient navigation can lead to high-quality breast cancer care, as measured by concordance with national guidelines, among an underserved vulnerable population in an urban setting. Further research is needed to examine other metrics of quality care that may be improved with patient navigation during cancer treatment.

AUTHOR CONTRIBUTIONS

Conception/Design: Beverly Moy, Aparna Raj, Naomi Ko, Tracy A. Battaglia
Provision of study material or patients: Beverly Moy

Collection and/or assembly of data: Beverly Moy, Aparna Raj, Naomi Ko
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REFERENCES

1. Mead H, Cartwright-Smith L, Jones K et al. Racial and Ethnic Disparities in US Healthcare: A Chartbook. New York: The Commonwealth Fund, 2008.
2. Moy B, Polite BN, Halpern MT et al. American Society of Clinical Oncology policy statement: Opportunities in the patient protection and affordable care act to reduce cancer care disparities. *J Clin Oncol* 2011;29:3816–3824.
3. Guadagnolo BA, Dohan D, Raich P. Metrics for evaluating patient navigation during cancer diagnosis and treatment: Crafting a policy-relevant research agenda for patient navigation in cancer care. *Cancer* 2011;117(15 suppl):3565–3574.
4. Moy B, Chabner BA. Patient navigator programs, cancer disparities, and the patient protection and affordable care act. *The Oncologist* 2011;16:926–929.
5. Freeman HP, Rodriguez RL. History and principles of patient navigation. *Cancer* 2011;117(15 suppl):3539–3542.
6. Fowler T, Steakley C, Garcia AR et al. Reducing disparities in the burden of cancer: The role of patient navigators. *PLoS Med* 2006;3:e193.
7. Freeman HP. A model navigation program. *Oncol Iss* 2004;Sept/Oct:44–46.
8. Schwaderer KA, Proctor JW, Martz EF et al. Evaluation of patient navigation in a community radiation on-

cology center involved in disparities studies: A time-to-completion-of-treatment study. *J Oncol Pract* 2008;4:220–224.

9. Wells KJ, Battaglia TA, Dudley DJ et al. Patient navigation: State of the art or is it science? *Cancer* 2008;113:1999–2010.

10. Battaglia TA, Roloff K, Posner MA et al. Improving follow-up to abnormal breast cancer screening in an urban population. A patient navigation intervention. *Cancer* 2007;109(2 suppl):359–367.

11. Phillips CE, Rothstein JD, Beaver K et al. Patient navigation to increase mammography screening among inner city women. *J Gen Intern Med* 2011;26:123–129.

12. Hughes ME, Ottesen R, Niland JC et al. Quality of breast cancer care in NCCN centers as assessed by the ASCO/NCCN quality measures: Overall performance and reasons for nonconcordance [abstract 6506]. *J Clin Oncol* 2009;27(15 suppl):324S.

13. National Cancer Institute. Surveillance, Epidemiology, and End Results. SEER Cancer Statistics Review, 1973–1998. Available at http://seer.cancer.gov/csr/1973_1998/, accessed April 24, 2012.

14. Lobb R, Ayanian JZ, Allen JD et al. Stage of breast cancer at diagnosis among low-income women with access to mammography. *Cancer* 2010;116:5487–5496.

15. Massachusetts Cancer Registry. Cancer in Massachusetts by Race and Ethnicity, 2000–2004. Available at <http://www.mass.gov/eohhs/docs/dph/cancer/race-ethnicity.pdf>, accessed April 10, 2012.

16. Christie J, Itzkowitz S, Lihau-Nkanza I et al. A randomized controlled trial using patient navigation to increase colonoscopy screening among low-income minorities. *J Natl Med Assoc* 2008;100:278–284.

17. Dignan MB, Burhansstipanov L, Hariton J et al. A comparison of two Native American Navigator formats: Face-to-face and telephone. *Cancer Control* 2005;12(suppl 2):28–33.

18. Campbell C, Craig J, Eggert J et al. Implementing and measuring the impact of patient navigation at a comprehensive community cancer center. *Oncol Nurs Forum* 2010;10:61–68.

19. Carroll JK, Humiston SG, Meldrum SC et al. Patients' experiences with navigation for cancer care. *Patient Educ Couns* 2010;80:241–247.

20. Guadagnolo BA, Boylan A, Sargent M et al. Patient navigation for American Indians undergoing cancer treatment: Utilization and impact on care delivery in a regional healthcare center. *Cancer* 2011;117:2754–2761.

21. Ell K, Vourlekis B, Xie B et al. Cancer treatment adherence among low-income women with breast or gynecologic cancer: A randomized controlled trial of patient navigation. *Cancer* 2009;115:4606–4615.

22. National Cancer Institute. Center to Reduce Cancer Health Disparities. Patient Navigation Research Program (PNRP). Available at <http://crchd.cancer.gov/pnp/pnp-index.html>, accessed March 28, 2012.

23. Freund KM, Battaglia TA, Calhoun E et al. National Cancer Institute Patient Navigation Research Program: Methods, protocol, and measures. *Cancer* 2008;113:3391–3399.

24. Ramsey S, Whitley E, Mears VW et al. Evaluating the cost-effectiveness of cancer patient navigation programs: Conceptual and practical issues. *Cancer* 2009;115:5394–5403.